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The Rico-Argo scenario in PRA score obtained a score of 50.12 with an assumption of one pound of harvestable fish collected from the Dolores River. ~~however~~ The fact that edible fish are being taken from the river is not totally certain based on conversations with CDOW staff and fishing shops in Durango; however, even without the fish the site scores a 30.20 based on the rare plant community on the banks of the Dolores River, four miles downstream from the R-A site. What-if scenarios assuming additional wetlands did not change the score, but wetlands has been added as a data gap in the event that the rare plant community has ceased to exist. Additional scenarios included on the <sup>attached</sup> disc include R-A soil (35.12) which did not include fish ~~p~~ poundage but assumed ~~did~~ include 123 residents at Level II soil contamination exposure. With the fish poundage added <sup>to the soil exposure,</sup> (R-A soil ~~scenario~~), the score increased to 53.23.

## 1.0 INTRODUCTION

URS Consultants, Inc. (URS) has been tasked by the U.S. Environmental Protection Agency (EPA) under the Alternative Remedial Contracts Strategy (ARCS) Contract Number 68-W9-0053 to conduct a Site Inspection Prioritization (SIP) (Work Assignment Number 21-8JZZ) for the Rico-Argentina (R-A) site (CERCLIS ID# COD980952519) located north of Rico, Colorado, 81332. Previous work at the site includes an EPA Potential Hazardous Waste Site - Site Inspection Report (Form 2070-13) compiled by State of Colorado, Department of Health (CDH) personnel in June 1984 and a second Form 2070-13 completed by an EPA contractor, Ecology and Environment (E&E), in November 1984. An EPA surface water and sediment sampling effort was conducted by E&E on November 14, 1985<sup>4</sup> and an Analytical Results Report (ARR) delivered to the EPA on July 29, 1985. The U. S. Department of the Interior, Bureau of Reclamation (BOR) has conducted ~~yearly~~ <sup>several times a year</sup> surface water and sediment sampling on Silver Creek and the Dolores River <sup>at several locations</sup> from 1989 through 1993 (Ecology and Environment (E&E) 1985; U.S. Environmental Protection Agency (EPA) 1984a; EPA 1984b; U. S. Department of the Interior, Bureau of Reclamation (BOR) 1994). This SIP was assigned to a URS investigator on April 11, 1994.

## 2.0 OBJECTIVES

The purpose of this SIP is to review existing data for the A-R site and identify whether data gaps exist with respect to the revised Hazard Ranking System (HRS) at the R-A site, and to provide sufficient documentation for the EPA to determine the human health and environmental impacts posed by the R-A site, thus determining the appropriate future course of action.

The specific objectives of this SIP are to:

- Summarize the previous work at the R-A site;
- Identify, quantify (if possible) and characterize ~~wastes~~ <sup>source areas</sup> attributable to this site;
- Identify waste availability to each migration pathway;
- Identify whether there is a potential for, or actual impact on, receptor targets; and
- Identify relevant data gaps for each migration pathway.



### 3.0 BACKGROUND

#### 3.1 SITE LOCATION

The R-A site encompasses approximately 75 acres of settling ponds near the east end of Dolores County in the Rico Mountains in the southwestern corner of Colorado (Figure 1). A total of approximately 2,500 acres of mining operations have been consolidated under one ownership (EPA 1984b). The Rico Mountains are a subsidiary group of peaks on the southwest fringe of the San Juan Mountains (U. S. Geological Survey (USGS) 1974). The legal description for the R-A site is the southeast quarter of Section 25, Township 40 N, Range 11 W. The approximate site coordinates are 37° 42' 05" North latitude and 108° 01' 39" West longitude. The site can be reached by proceeding south from Telluride, Colorado on State Highway 145 over Lizard Head Pass to Rico or by proceeding north from Cortez on state Highway 145.

#### 3.2 SITE DESCRIPTION

Site description information included here is taken primarily from EPA; CDH; and State of Colorado, Division of Mines (DOM) file documents. The R-A site is an inactive mining operation located in portions of two drainages above the town of Rico. The underground workings are interconnected and the drainage water from the mines is sent to the St. Louis Tunnel Adit and discharged into a slaked lime water treatment plant and then a series of 18 settling ponds before discharging into the Dolores River. The R-A complex has had a National Pollutant Elimination Discharge System (NPDES) permit (#CO-0029793) for this discharge system since 1976 but has been frequently in violation of permit standards (U.S. Environmental Protection Agency, Water Management Division (WMD) 1994). The discharge has also been regulated under the Colorado Pollutant Discharge Elimination System (CPDES). The St. Louis Adit is approximately three quarters mile to the north of Rico (USGS 1960). This area is also the location of a large, inactive sulfuric acid plant and two cyanide heap leach basins. Approximately one mile northeast up Silver Creek are located another series of tailings piles and settling ponds and the Rico-Argentine Mill (Figure 2). The entire Rico area has been heavily mined in the past. The R-A region is primarily Bureau of Land

Silver Creek and the Dolores River have their confluence within the town of Rico. (Figures 1 and 2)

The discharge averages approximately 1.1 to 1.5 million gallons per day (MGD) (WHO 1994). Near the St. Louis Tunnel Adit on the

Dolores River are also

the Blaine Tunnel

flotation mills in Salt Lake City until 1926 at which time a 250-ton custom mill was built at Rico by the International Smelting Company, a subsidiary of Anaconda Mining Company. The RAMC, working the south side of Silver Creek, was one of the major producers during this period. Base-metal peak production occurred in 1927, by 1928 the custom mill in Rico had shut down, in 1929 the Depression drove down the economy and by 1932 production has ceased (USGS 1974).

Mining resumed in 1934 and <sup>activities</sup> fluctuated until 1939 when RAMC finished a 135-ton flotation mill and started steady production (BOM 1939a; BOM 1939b). The RAMC obtained control of most of the mining properties in the district during this time (BOM 1949a; USGS 1974). By 1940, the mill capacity was up to 150 tons (BOM 1940; USGS 1974). In the early 1940s, RAMC began selling pyrite ore to vanadium producers in Utah (BOM 1942b; BOM 1943). The narrow-gauge railroad line was abandoned in 1951 for economic reasons. By 1955, the long crosscut from the Argentine shaft on Silver Creek to the St. Louis tunnel on the Dolores River was finished, lowering the water level in the Silver Creek workings by 450 feet. Also in 1955, RAMC completed and put in operation a plant for the production of sulfuric acid from pyrite near the St. Louis Adit. Nine years later, the plant was put on standby basis due to a cutback in the uranium program in which the sulfuric acid was used (USGS 1974).

On May 26, 1971, all RAMC mining operations <sup>was</sup> were ceased, equipment below the 500 level removed and the lower levels allowed to flood and drain through the St. Louis Tunnel (BOM 1971). In 1973, RAMC sampled the old mine dumps and began work on a 300 foot by 500 foot leaching pad next to the old sulfuric acid plant. <sup>A Hypalon liner was installed in this leach pad.</sup> A precipitation and recovery process using three pounds of cyanide per ton of water was begun on a pile containing approximately 100,000 tons of raw ore. Early in the start-up, an overflow of the leach <sup>ing liquor</sup> reagent occurred with an unknown amount released to the Dolores River (BOM 1974). <sup>In 1974,</sup> Approximately \$1,200,000 of production <sup>including gold and silver</sup> was obtained (State of Colorado, Division of Mines (DOM) 1975a). In 1975, an additional leach pad containing 55,000 tons of raw ore was constructed in a settling pond originally used by the acid plant. A Hypalon liner was placed in this pad and a 3% to 4% cyanide solution used with added lime (DOM 1975b).



The Anaconda Copper Company (ACC) acquired the Rico Argentine Mine property from RAMC in 1980. ACC began a surface drilling program for exploration, mostly of molybdenum (Anaconda <sup>Minerals</sup> Copper Company (ACC) 1994; DOM 1980; DOM 1981). ACC continued with both surface and underground exploratory drilling over the next several years (ACC 1994; DOM 1982; DOM 1983). ACC also built a water treatment plant at the St. Louis Tunnel discharge and carried out several other environmental efforts such as pond stabilization, adit plugging, and capping of wells (ACC 1994; WMD 1994).

In 1984, an EPA Potential Hazardous Waste Site - Site Inspection Report (Form 2070-13) was completed after a site visit by two CDH geologists. Minimal information is contained in the report although it did discuss a NPDES permit issued to RAMC in 1976 with a compliance schedule (EPA 1984a). This permit has been renewed several times and currently is in effect through September 30, 1995 (WMD 1994). The report also stated that the CDH Water Quality Control Division (WQCD) issued a Notice of Violation (NOV) and a Cease and Desist Order (CDO) in 1980 because of RAMC problems in meeting compliance limitations (EPA 1984a). The NOV and CDO were amended on December 17, 1981, and specified exceedances of zinc and copper standards. This led to the development of a water treatment system using slaked lime at the St. Louis Tunnel Adit (WMD 1994). In October 1984, E&E's Field Investigation Team (FIT) conducted a site visit which confirmed that ACC had started water treatment operations using slaked lime at the St. Louis Adit. E&E personnel also found two piezometer wells, between the Silver Creek tailings ponds and Silver Creek, apparently installed in 1981 by Dames and Moore as part of a geotechnical study on the stability and potential expansion of the ponds (E&E 1984a). A sampling plan was issued on October 18, 1984 (E&E 1984b). Field sampling was conducted on November 14, 1984 and involved the collection of nine surface water samples and eight sediment samples. <sup>No source or target samples were collected during the sampling effort.</sup> Field personnel noted that leachate appeared to be migrating from the settling ponds <sup>above</sup> on Silver Creek <sup>Silver Creek</sup> to the surface water. <sup>E&E 1984c</sup> They also noted that both surface water bodies contained iron-stained cobbles (E&E 1984b; EPA 1984b). An ARR was issued by E&E in 1985. The ARR concluded that the surface water samples contained elevated manganese concentrations and that the sediment samples contained arsenic, cadmium, copper, iron, lead, manganese and zinc at much higher concentrations than upgradient

samples (E&E 1985). A NOV was issued by CDH to ACC for cadmium permit standard violations in November and December 1984 (WMD 1994).

In 1988, ACC sold their holdings in the Pioneer District, approximately 2,500 acres, to the Rico Development Corporation (RDC), a division of Crystal River exploration and Production Company (ACC 1994; CDH 1988; EPA 1984b; WMD 1994). Fish tissue samples collected from September 1989 through March 1991, at reservoirs approximately 40 miles downstream from the R-A site, were found to contain high levels of mercury (E&E 1991a; E&E 1991b). The U.S. Department of the Interior, Bureau of Reclamation (BOR) began <sup>surface water and sediment</sup> sampling in 1989 along the upstream reaches of the Dolores River and its

tributaries to determine potential sources of the mercury. This sampling has continued <sup>periodically</sup> every year through 1993. The sediment data shows Silver Creek to be the major source of heavy metals, including mercury, in the upper Dolores River basin. The April 1992 water samples indicate that, in addition to Silver Creek, there are numerous sources of mercury in the upper Dolores River basin and many of them are located well downstream from Silver Creek. The study also shows metal loading from

Since RDC obtained the property from ACC, violations of the discharge permit have continued. Another NOV and CDO were issued in 1990 for violations of lead and silver standards. Unpermitted discharge from the Blaine Tunnel on Silver Creek also was reported in 1990 with a resulting concrete dam <sup>which is in construction of a</sup> placed by RDC <sup>to plug</sup> into the Blaine Tunnel (WMD 1994). The St. Louis Tunnel discharge has also repeatedly failed the Whole Effluent Toxicity (WET) testing required by the NPDES permit. An additional NOV was filed in 1993 for silver violations and a notation made about wastewater flowing into the old cyanide basins in which the old Hypalon liners are visibly weathered and torn. In 1994, the permit violations have included silver, lead and zinc (WMD 1994). (WQCC 1993)

In April 1994, the property was sold to Azure, Inc., a development company from Phoenix, Arizona, who is looking into real estate development possibilities. Azure, Inc. has retained Walsh and Associates as a consultant (Theile 1994). <sup>skt Azure, Inc.</sup>

### 3.4 SITE GEOLOGY

Detailed information about the geology of the R-A site area can be found in "Geology of the Rico Mountains, Colorado" by Whitman Cross and Arthur Coe Spencer (USGS 1900); "Geologic Atlas of the United States, Rico Folio" by Whitman Cross and F. L.



Ransome (USGS 1905) and "Geology and Ore Deposits of the Rico District, Colorado" by Edwin T. McKnight (USGS 1974).

The geology of the Rico Mountains is extremely complex with the dominant structure of the district a faulted dome centered near a monzonite stock. A central faulted horst block of Precambrian rock has been uplifted about 6,000 feet. The lower slopes of the Rico district are generally covered by debris from the hillsides from wash, talus and landslide processes (USGS 1900; USGS 1905; USGS 1974). *(State of Colorado, Geological Survey (CGS) 1975)*

Bedrock in the district ranges from Precambrian to Permian. Precambrian rocks include older greenstone and metadiorite and later Uncompaghre Quartzite which is at least 1,000 feet thick. Overlying the Precambrian is Devonian age Ouray Limestone succeeded by Mississippian Leadville Limestone with a combined thickness of approximately 169 feet. Both formations have been metamorphosed by the monzonite intrusive body. Approximately 2,800 feet of Hermosa Formation (Middle Pennsylvanian age) is the next youngest strata. The Hermosa Formation is of great economic interest because most of the ore deposits of the district occur in it, particularly in its limestone beds. The Hermosa is overlain by the Rico Formation (300 feet thick) of Middle and Late Pennsylvanian age. The highest formation exposed in the district is the Cutler Formation of Early Permian age with at least 2,800 feet of strata remaining (USGS 1900; USGS 1905; USGS 1974).

At the end of the Mesozoic Era, the sedimentary sequence was intruded by sills and dikes of hornblende porphyry. At a later stage, the sequence was intruded by a less silicic stock of monzonite. Channelized metamorphism may extend up to 1.7 miles from the stock (USGS 1974).

The ore deposits of the district consist of (USGS 1905; USGS 1974):

- Massive sulfide replacement deposits in the limestones of the Hermosa Formation;

- Contact metamorphic deposits of sulfides and iron oxides in limestones of Ouray, Leadville and Hermosa Formations;
- Veins on fractures and small faults in Hermosa sandstones and arkoses; and
- Replacement deposits in residual debris in lower the Hermosa Formation (the rich blanket deposits).

### 3.5 SITE HYDROGEOLOGY

*Don't use "aquifer of concern" as per PAT discuss contaminant or targets to infer "aquifer of concern"*

The aquifer of concern at the R-A site is the shallow alluvial aquifer. No hydrogeologic studies of this area were located during this investigation; thus, the following discussion is based on assumptions from available geologic studies. *The principal aquifer in the R-A site area is the shallow alluvial aquifer.*

*direction of flow*

As stated in Section 3.4, Site Geology, the valley sides and bottom are thickly covered by detritus from weathering and erosion. This material forms a shallow unconfined aquifer through which the streams and rivers of the region flow. Hydraulic conductivity is assumed to be fairly high ( $10^{-2}$  centimeters per second (cm/s)) (Office of the Federal Register 1990). *The direction of shallow groundwater flow is estimated to be south along the Dolores River and southwest along Silver Creek (EPA 1994b)* Some local areas, such as near tailings piles, may seal themselves through the sifting of fine-grained material (BOR 1994). The shallow aquifer is heavily mineralized in most cases. The State of Colorado, Division of Highways, drilled a well on the south end of the town of Rico for water supply for a maintenance shop but had to abandon it after a couple of years due to heavy mineralization in the pipes (State of Colorado, Department of Transportation (CDOT) 1994; State of Colorado, Office of the State Engineer (CSE) 1994).

Deeper bedrock aquifers exist in the various limestone strata in the older formations and in the fractures in the formations. Several of the old exploratory drill holes on the Dolores River portion of the site, flowed water and had to be capped (ACC 1988; ACC 1994). Groundwater reaches the surface in the form of several seeps and springs found in the area and a number of these appear to be geothermal in nature. One drill hole is used by locals to supply hot water to a pool the locals use to soak in (Jahnke 1994). Many of the springs contain carbonic acid gas and sulphureted hydrogen (USGS 1905),



some springs are calcareous due to the high carbonate of lime contained by many of the geologic formations and several springs are iron-bearing and have left local deposits of iron oxide (USGS 1900). *In the vicinity of the R-A complex, deep groundwater has been allowed to flood the abandoned workings and is discharged through the St. Louis Tunnel Adit to a small treatment system (EPA 1984b; USD 1994).*

### 3.6 SITE HYDROLOGY

The Dolores River and its Silver Creek tributary are the major surface water bodies of ~~concern~~ in the R-A site area. The Dolores River flows to the south past the St. Louis Tunnel Adit, the old sulfuric acid plant, the cyanide heap leach basins, and numerous tailings piles and settling ponds (USGS 1960). Silver Creek flows to the southwest and is the source of the town of Rico's drinking water. Below the drinking water diversion, Silver Creek flows past several mine workings including the Blaine Tunnel and the Rico Argentine Mill and settling ponds. Silver Creek flows through the town of Rico before joining the Dolores River on the western edge of Rico. The only flow rate data is from a gage on the Dolores River at a point four miles below Rico. At this station the 41-year annual mean flow rate is 136 cubic feet per second (cfs) and the upstream drainage basin encompasses 105 square miles (mi<sup>2</sup>) (USGS 1993). The Dolores River is not used as a source of municipal drinking water; however, there are twelve listed diversions within fifteen downstream miles of the R-A site. *One of these is listed as multiple use with partial domestic water supply (this diversion is the St. Louis Tunnel) and the others are irrigation, stockwatering, industrial, recreation, fire and other uses (CSE 1994).* *used for* *surface water diversions* *purpose*

### 3.7 SITE METEOROLOGY

The R-A site is located in a semiarid climate zone. The mean annual precipitation, as totaled from the University of Delaware (UD) database, is 12.8 inches. The net annual precipitation as calculated from precipitation and evapotranspiration data obtained from the UD is 4.1 inches (University of Delaware (UD) 1986). The 2-year, 24-hour rainfall event for the site is approximately 1.5 inches (Dunne and Leopold 1978).

*The St. Louis Tunnel is the only diversion with domestic use listed, as well as industrial and stockwatering; however, it is doubtful that any domestic use actually occurs from this water source.*

#### 4.0 PRELIMINARY PATHWAY ANALYSIS

This following analysis will consider potential site impacts on the air pathway, groundwater pathway, surface water pathway, and soil exposure pathway utilizing HRS guidelines (Office of the Federal Register 1990).

##### 4.1 SITE SOURCE QUANTITY AND CHARACTERISTICS

Source areas at the R-A site include the estimated 75 acres of tailings piles and settling ponds along both the Dolores River and Silver Creek (EPA 1984b). *The St. Louis Tunnel discharge of 1.1 to 1.5 MGD is also considered a R-A source (WMD 1994).*  
*The source areas are*  
~~An estimated 400,000 tons of waste exists~~ *material* at the R-A site (EPA 1984b). A number of sampling efforts have been conducted at the site. These include an ACC contractor from 1980 through 1983, EPA-sponsored sampling in 1984 and BOR sampling from 1989 through 1993. These sampling efforts focused on surface water and sediment analyses (EPA 1984b; E&E 1985; BOR 1994). No characterization of the tailings piles, tailings ponds or settling ponds has been located in the file search; however, review of geologic studies, mining texts and personal conversations with employees of the old mining companies, leads to an assumption that cyanide and the heavy metals typically associated with sulfide ores would be the contaminants of concern in the source areas. No mention of the use or storage of any other hazardous wastes was found in the files.

From reports in EPA, CDH and BOR files, it is assumed that all tailings piles, tailings ponds and settling ponds were constructed with native material without liners or runoff/runoff controls. The two cyanide heap leach pads that were built did incorporate Hypalon liners and overflow berms but these have not been maintained to the present time (BOM 1974; DOM 1975b, WMD 1994).

##### 4.2 AIR PATHWAY

No ambient air monitoring has been performed at the R-A site. The air pathway was evaluated on the potential to release.



#### 4.2.1 Target Populations

Approximately 92 people live in the town of Rico and 123 residents are listed in the U.S. Census Bureau's Rico division which is within the four-mile target distance limit (U.S. Department of Commerce (USDOC), Bureau of the Census 1990). No other residents were located. The federally listed threatened and endangered Bald Eagle (*Haliaeetus leucocephalus*), Peregrine falcon (*Falco peregrinus*) and Mexican spotted owl (*Strix occidentalis lucida*) potentially inhabit the area (U.S. Department of the Interior, Fish and Wildlife Service (FWS) 1994). Federal candidate species North American wolverine (*Gulo gulo luscus*) and Northern goshawk (*Accipiter gentilis*) may also inhabit the Rico area (FWS 1994).

No National Wetland Inventory maps have yet been prepared for this area (Earth Science Information Center (ESIC) 1994). The EPA's 1984 sampling effort did not find wetlands within one mile of the site (EPA 1984b); however, it is reasonable to assume that forested and emergent wetland vegetation exists within the specified four-mile target distance limit. A significant community of montane riparian forest (*Populus augustifolia*-*Picea pungens*/*Alnus incana*) can be found on the east bank of the Dolores River within four miles of the site. This natural community is ranked rare to uncommon both globally and in Colorado (Colorado Natural Heritage Program (CNHP) 1994).

#### 4.2.2 Air Pathway Specific Data Gaps

After performing an analysis of all potential sources on site, URS was not able to identify areas where additional data acquisition is required.

### 4.3 GROUNDWATER PATHWAY

The groundwater pathway was evaluated on the potential to release. No groundwater monitoring data is available. The CPDES permit monitoring does show a release of

silver, lead and zinc from groundwater drainage discharging from the St. Louis Tunnel (WMD 1994).

#### 4.3.1 Target Populations

The population potentially impacted by groundwater contamination consists of the users of three wells listed as household use by the Colorado State Engineer (CSE 1994). Two of these wells are located approximately one-half mile upgradient of the St. Louis Tunnel Adit and its associated settling ponds on the Dolores River. <sup>Sources</sup> ~~According to the owner of one of these wells, no water quality problems have been encountered since drilling the well for a drinking water source in 1990 (Jahnke 1994).~~ The third domestic well is at the south end of the town of Rico, approximately one and one-half miles downgradient of the source areas and below the confluence of Silver Creek and the Dolores River (CSE 1994; USGS 1960). Approximately six people use these wells, possibly for drinking water (USDOC 1990). <sup>Jahnke 1994;</sup>

#### 4.3.2 Wellhead Protection Area

The R-A site does not lie within a state or federally designated wellhead protection area (State of Colorado, Department of Health, Water Quality Control Division (WQCD) 1994). <sup>The state engineer lists the well depth as 160 feet; however, the owner was unsure what the ~~screened~~ depth the screened interval was (CSE 1994; Jahnke 1994).</sup>

##### 4.3.2.1 Resource Use

Groundwater within the specified four-mile target distance limit is limited to the three household wells discussed in Section 4.3.1 and one industrial use well owned by the Rico Development Corporation (CSE 1994).

#### 4.3.3 Groundwater Pathway Specific Data Gaps

After performing an analysis of all potential site-related sources and associated receptor targets, URS has been unable to identify areas where additional data acquisition is required.



#### 4.4 SURFACE WATER PATHWAY

The surface water pathway was evaluated on observed release by chemical analysis.

##### 4.4.1 Drinking Water Threat

The drinking water threat is used to evaluate the threat associated with the actual or potential release of hazardous substances from a site to drinking water resources. There are no municipal drinking water diversions within fifteen downstream miles from the R-A site on the State Engineer's Water Rights Report. There are twelve total diversions on the Dolores River, one of which includes domestic use in its multiple use codes. This water right is listed as the St. Louis Tunnel and includes industrial and stockwatering as its other uses (CSE 1994).

# The town of Rico obtains its drinking water from a diversion on Silver Creek well above the mining impacts. The water is treated through infiltration galleries and chlorinated (E9E 1994c).

##### 4.4.2 Human Food Chain Threat

The human food chain threat is used to evaluate the threat associated with the actual or potential release of hazardous substances to surface water containing human food chain organisms. ACC contractors found decreased aquatic life in the Dolores River in the 1980s, but could not attribute it to the site (EPA 1984b). A number of federally listed threatened and endangered fish may utilize the surface water habitat as discussed in the next section under Environmental Threat. The presence of harvestable sizes of game fish has not been confirmed. The State of Colorado, Division of Wildlife (CDOW) conducted fish studies on two 500 foot reaches of the Dolores River near Spruce Creek, one and one-half miles below Rico, in 1982 and found three rainbow trout between ten and twelve inches in length and one small brown trout. The CDOW performed habitat improvement in the form of instream boulders and check dams which led to increased populations of brown trout between five and six inches in length in 1983. By 1984, CDOW fish sampling showed greatly increased populations of ten to twelve inch brown trout and slightly increased populations of rainbow and brook trout (State of Colorado, Division of Wildlife (CDOW) 1994). Local

bait and tackle shops confirmed the presence of harvestable game fish in the upper reaches of the Dolores River (Duranglers 1994).

#### 4.4.3 Environmental Threat

The environmental threat is used to evaluate the threat associated with the actual or potential release of hazardous substances from a site to sensitive environments specified by state and federal statutes. While no National Wetland Inventory maps are available for the upper Dolores River area, it may be assumed that a limited amount of emergent vegetation exists within the specified fifteen-mile downstream target distance limit. The 1984 EPA sampling effort did not locate existing wetlands within one mile of the site (EPA 1984b). A significant montane riparian forest can be found on the east bank of the Dolores River within four downstream miles of the site area (refer to Section 4.2.1 for more discussion). Another montane riparian forest community (*Populus angustifolia*/*Cornus sericea*) occurs along the Dolores River approximately fifteen miles downstream from the R-A site. This natural community is ranked very rare globally and in Colorado (CNHP 1994).

Federally listed threatened and endangered aquatic species that potentially use the Dolores River include the Colorado squawfish (*Ptychocheilus*), the Humpback chub (*Gila cypha*), the Bonytail chub (*Gila elegans*) and the Razorback sucker (*Xyrauchen texanus*). Federal candidate species include the Flannelmouth sucker (*Catostomus latipinnis*) and the Roundtail chub (*Gila robusta*) (FWS 1994).

Resource  
Use? →

#### 4.4.4 Surface Water Pathway Specific Data Gaps

After performing an analysis of all potential site-related sources and associated receptor targets, URS has determined that no significant data gaps exist.

- identified the following data gaps with regard to the surface water pathway:*
- *No source characterization sampling has been conducted at the R-A site and*
  - *Confirmation of harvestable quantities of fish being collected from the Dolores River; and*
  - *Determination of existence of <sup>impacted</sup> wetlands on the Dolores River.*